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FINANCIAL RATIO ANALYSIS OF TWO OF THE WORLD'S LARGEST NETWORK PAYMENT PROCESSOR COMPANIES: A CASE STUDY OF VISA AND MASTERCARD 2016-2021

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The document length is 10755 words from the introduction to the end of the conclusion.

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ABSTRACT

The network payment processing industry explores competition observing even more industry consolidation and drawing tech-experts in this sector. Since the global financial crisis, technology has advanced, new innovations have been made alongwith intensified competition forcing the larger businesses like Visa and Mastercard in this sector to increase their research to discover how the expanding digital demand of consumers is reshaping the payments sector and how to compete with these new payment processing companies. Still, over the past 6 years, the total transactions of Visa and Mastercard have increased more than those of other network payment processing companies, and the net profit for Visa and Mastercard has increased, excluding the year 2020 as an exception.

Using a ratio analysis, this research aims to evaluate the financial performance of the network payment processing companies (Visa and Mastercard). This research also has an objective to improve understanding and knowledge of financial ratio analysis and to discover areas where they perform well and where they perform poorly utilizing publicly accessible financial data. The financial information is extracted from the company's annual reports for the years 2016 to 2021. With the use of graphical measurement, a total of eight different financial ratios from liquidity, profitability, activity and solvency are computed and analysed.

Based on the results of past 6 years, the findings shows that in terms of liquidity, solvency and profitability Visa has performed really well. Having said that, Mastercard has good returns on equity and assets along with better assets turnover ratio. Visa has more favorable average collection period than that of Masterdcard as Visa implies higher liquidity with the ability to collect accounts receivable with a substantially lower collection period than that of Mastercard.

Keywords: Network payment processing, Financial ratio analysis, Visa, Mastercard

INTRODUCTION

This thesis examines the financial ratios of two of the world's largest network payment processor companies. In selecting this topic, the author did so since it is directly relevant to his professional career and will aid him in his learning process and higher education in the future. Four companies today hold a monopoly on the electronic payment industry. Visa, Mastercard, American Express, and Discover are the companies that process the vast majority of card payments worldwide (Meola, 2022). Visa and Mastercard offer unique services because neither business extends credit nor issues cards. This means the payment cards for Visa and MasterCard are issued via a co-branding arrangement. While neither organisation lends credit nor issues cards, they work together to provide the broadest possible choice of products, including credit, debit, and prepaid cards. In terms of financial performance, both companies are doing quite well, and they've been major players in the network payment processing market for a long period of time.

The purpose of this research is to assess the financial performance of the network payment processing companies (Visa and Mastercard) using a ratio analysis. Financial ratio analysis aids in the understanding of several elements impacting a business's performance, including its costing and pricing tactics, as well as its debt and asset management efficiency. This study provides information that may assist managers and other stakeholders in evaluating the operations of businesses. The study also involves a review of financial ratios for the specified time period and a comparison of the ratios of the case companies with one another. By using the data gathered during this research, recommendations may be made to assist businesses in optimising their performance in various sectors. When such data is used, decision-making and strategy development become more precise. Along with getting a better understanding of financial ratio analysis, the purpose of this study is also to discover areas where corporations perform well and places where they perform poorly by evaluating the companies' actual financial statements provided in their annual reports. The author came up with these research questions because he thought that financial ratio analysis could be used to figure out how well a company was doing financially.

Research Questions

1. How could financial ratio analysis be used to analyse and evaluate the financial performance of the network payment processor companies?
2. What is the market share of Mastercard and Visa at revenue segment levels?
3. By examining financial ratios, how do we determine which company (Visa or MasterCard) is performing well?
4. What is the financial performance of these companies in terms of profitability, liquidity, debt management, asset management, and Solvency?

This thesis is separated into theoretical and empirical sections. The theoretical portion of this paper focuses on conceptual knowledge of financial rations and their use in financial analysis, as well as an overview of both network payment processing firms (Mastercard and Visa). This theoretical section defines and explains each financial ratio that the author employed in this study. The empirical section details the calculation and analysis of distinct financial ratios for Mastercard and Visa, respectively. Additionally, it analyses the performance of both organisations using numerous charts and figures.

The research will include a comparison of both companies' financial ratios for the specified time period (2016–21). The author conducted a quantitative study using secondary data sources: annual reports of Mastercard and Visa for the years 2016–21, using financial statements (including statements of operations and balance sheets). The author is using data from 2016 to 2021 since it enables an understanding of the company's historical and current financial status, as well as the ability to generate financial projections for the following years.

The author will focus on the introduction, followed by research questions and the idea of financial ratio along with the idea of analysis in the first chapter of this thesis paper. The author here discusses the purpose and application of the study while also explaining what a financial ratio is. The second chapter is devoted to an overview of the industry where it contains general information on Mastercard and Visa, as well as their histories as well as the calculation of financial ratios for Mastercard and Visa for the years 2016–2021, along with research and comparison of the financial ratios of both companies. The last chapter is the conclusion, in which the author summarizes the findings and conclusions, followed by references and appendices.

1. FINANCIAL RATIO ANALYSIS

1.1. Financial ratios

Financial ratios are indicators that are used to measure a company's performance. Analyzing profitability, liquidity, and efficiency may provide valuable information. They are expressed in percentages, proportions, or times to quantify the relationship between two or more accounts on the financial statements (NCERT, 2007/2021). There are hundreds of financial measures that aid in the analysis and forecasting of trends and performance (Krylov, 2018). Numerous people and organisations, including corporate executives, investors, creditors, and shareholders, use financial ratios to get a better understanding of a business's financial status and performance. Managers mostly use financial ratios to make decisions, since they may identify weak areas that need to be addressed, while investors primarily use ratios to assure the safety of their assets and their potential value increase. Creditors use ratios to assess the risk of lending money to a particular business, and shareholders, who depend heavily on ratios, use them to estimate the worth of their shares (Ross et al, 2016).

Financial ratio analysis may be performed on a variety of different types of businesses (financial institutions, aviation sectors, telecommunications, and so on). Financial ratio analysis is often conducted in one of three ways: time series, cross-sectional, or by comparing ratios to a benchmark, which most ratios lack or vary by industry. The objective is to evaluate a firm's operational, investment, financial, and dividend management performance and effectiveness (Palepu, K. G., & Healy, P. M., 2013). Several studies that effectively investigated the financial ratios of businesses and discovered answers to their research problems in several areas, such as financial performance, profitability, capital efficiency, liquidity, and solvency. Financial ratio analysis also helps in evaluating the company's performance and using this data for future planning (Husna, N., & Desiyanti, R., 2016). Financial ratio analysis is critical for understanding financial statements, identifying and monitoring changes and improvements in a company's financial accounts, as well as recognising changes in positive and negative financial patterns (Rashid, 2018). Financial ratio analysis also enables the examination of previous performance, the study of current financial circumstances, and the provision of some insight into the company's prospective future outcomes. It also helps to determine management's and financial stability's desire to obtain the necessary funds to grow and meet financial short- and long-term

responsibilities (Robinson et al, 2009). Financial ratios are also particularly useful in interpreting financial statements because they enable comparisons of data from one financial statement to another (Williams et al, 2008). When it comes to financial ratio analysis, the users are divided into two categories: internal and external. Internal users include employees and managers from various divisions inside the organisation, while external users include creditors, analysts, students, and financial journalists. Internal users do more in-depth analysis than external users do because internal users have access to more current data than outsiders, who must rely on financial statements or information disclosed in the company's annual reports (Hampton, 2011). In addition to the advantages that financial ratio analysis provides, there are some disadvantages to consider as well.

The following are some of the advantages and disadvantages of financial ratio analysis:

Advantages: Ratio analysis may be used to get insight into management's capabilities and financial flexibility to generate the appropriate quantity of cash for growth and obligation fulfilment (Robinson et al, 2009). It assists in assessing the efficiency with which a business or organisation operates. By illustrating the relationships between various data sets, ratio analysis assists in discovering difficulties or concerns in a company (Owen A., 2013). Additionally, it assists in projecting the firm's budget by analysing prior ratios. Ratio analysis allows the examination of historical performance, the assessment of present financial circumstances, and the development of an understanding of the prospective future outcomes of a business. Financial ratios also allow cross-firm and sector comparisons due to the ratios' proportionality (Vasigh, B., & Rowe, Z. C., 2019). It gives consumers critical information about accounting information and the business's success. Financial ratio analysis enables comparisons of firms across time and within the same sector. Financial ratio analysis is an extremely valuable technique for financial management since ratios are believed to be basic and straightforward (Hampton, 2011).

Disadvantages: Financial ratio analysis limits the comparison of two organisations from different sectors, as ratios may be unclear because of the diverse environmental positions these organisations hold, such as market structure, regulation, and so on. A company's financial statements are used to generate financial ratios. The ratios will be inaccurate if there are errors in the financial statements. Companies may also improve the appearance of their financial statements by applying several approaches, and this window dressing of financial statements will also have an impact on the ratios and could mislead the investors as well as the users of these ratios. Different accounting requirements, along with the use of distinct accounting

systems, limit the comparability and make ratio analysis less useful in certain situations. For example, if the companies use different techniques of depreciation or inventory management, the results of ratio analysis comparisons between these two businesses could be inaccurate (Brigham, E. F., & Houston, J. F, 2016). While ratio analysis mostly demonstrates the relationships between previous data, consumers might also be more interested in present and future data.

1.2. Liquidity ratios

Liquidity is a metric that indicates how fast a business can convert its assets to cash. Liquidity analysis quantifies and analyses a business's capacity to satisfy immediate commitments. Current commitments are those that expire within a year. The liquidity ratio is a financial statistic that indicates the connection between a company's cash and other existing assets and its current obligations. Liquidity may be assessed in two ways: static and dynamic. Static liquidity refers to the ability to meet obligations at a certain point in time, such as the balance sheet date or the end of the fiscal year. On the other hand, dynamic liquidity refers to the ability to meet future cash flow requirements. Liquidity ratios indicate a business's capacity to meet short-term obligations. Liquidity management may be accomplished in daily operations by maximising asset use and, in the long term, by controlling the structure of obligations. The amount of liquidity required varies by industry, and a good study of a company's liquidity condition requires an examination of its historical financing requirements, present liquidity position, and projected funding needs (Robinson et al, 2009).

To determine the liquidity of Mastercard and Visa, current and quick ratios will be used. Along with the benefits, these ratios have certain drawbacks. The drawback of utilising current and quick ratios to evaluate liquidity is that these ratios do not take into account the time of cash collections and payments. Additionally, if a business's existing assets consist only of merchandise, this does not adequately reflect the firm's capacity to continue (Samonas, 2015).
The current ratio is the first ratio that will be discussed in this paper. It is the connection between current assets and current liabilities. It is used to determine a business's liquidity and capacity to repay short-term debt (Weygandt et al, 2015). To yield a current ratio, the total current assets are divided by the total current liabilities. Current assets and liabilities have the same book value when the ratio is 1.0. If a company's current ratio is greater than one, it is regarded as more

liquid. A higher current ratio indicates stronger liquidity, implying that the business is better able to satisfy its short-term obligations. Historically, several banks and other short-term creditors asserted that a corporation with a current ratio of 2:1 or above posed a low risk of default (Williams et al, 2008).

$$Current\ Ratio = \frac{Current\ Assets}{Current\ \ Liabilities} \quad (1)$$

Source: (Brigham, E. F., & Houston, J. F, 2016)

The quick ratio is one of the liquidity ratios that analysts use to estimate a company's capacity to pay short-term creditors. Since it exclude inventories and other non-liquid assets, such as prepaid costs, the quick ratio is a more stringent measure of liquidity(Warrad, 2014). The quick ratio depicts the link between quick assets and current liabilities, and by removing inventory, it provides a more meaningful indication of a company's capacity to meet its short-term obligations. As a general rule, a 1:1 ratio is considered to be a good quick ratio (White et al, 2014).

$$Quick\ Ratio\ = \frac{Cash + Marketable\ securities + Receivables}{Current\ Liabilities} \quad (2)$$

Source: (Warrad, 2014)

1.3. Profitability ratios

A profitability ratio is a ratio that is used to determine how profitable a business is in terms of profit as a proportion of revenue. Profitability ratios may be calculated in two ways. The first is via revenue, while the second is through investment. Among academics, ROA and ROE are the most often used metrics for assessing profitability. The profitability ratio, when expressed in terms of ROA and ROE, demonstrates the investment's desirability. Investors are more likely to make decisions when a business has a good profitability ratio (Husain, T., & Sunardi, N. , 2020). The profitability of a company is of particular importance to investors with long-term portfolios. For example, shareholders will pay attention to the price-to-book value (PBV) ratio, which reflects the market's likelihood of producing a firm's value for the amount of capital invested. This research calculates a company's profitability ratio using the Return on Assets (ROA), Return on Equity (ROE) and Profit Margin method.

Return on assets (ROA) is a measure of a company's ability to produce revenue from its assets. The return on assets (ROA) is a useful tool for examining how well a company's assets have generated profits. This ratio indicates a company's capacity to convert its assets into earnings when comparing it to other firms in the same industry. In terms of profitability, ROA is one of the most important profitability measures. In the case of ROA, 5% is regarded as acceptable. Low ROA may be a negative indicator of a company's growth potential since it indicates that assets are not being utilised profitably (Robinson et al, 2009). The issue with the ratio is that net income represents the return to shareholders, while assets may be funded using both stock and debt. In the meantime, if the firm's return on assets (ROA) remains at a high level, it might be proven that the company is not reestablishing its assets, which could be due to the company's losses (Gallo, 2016). The return on assets (ROA) is derived by dividing net income by the average asset value. The average asset value is computed by adding the total value of current and prior year assets and dividing by two.

$$Return\ on\ Assets = \frac{Net\ Income}{Average\ Assets} \quad (3)$$

Source: (White et al, 2014)

Return on equity (ROE) is "the ratio used to determine a company's performance in generating profits for shareholders." Return on Equity (ROE) illustrates a business's efficiency or inefficiency in maximising the return on its owners' or shareholders' capital. Depending on the amount of equity capital invested and the amount of debt financing used, the ROE of a company may change within the industry (Vasigh, B., & Rowe, Z. C., 2019). According to Lestari and Sugiharto, a positive rate of return on equity (ROE) exists if it is more than 12% (Lestari M.I. and Sugiharto T. , 2007). Stockholders anticipate a higher rate of return on their investments, and this ratio indicates how well the business is doing financially. The ROE is computed similarly to the ROA by dividing net income by average equity. The average equity is computed by adding the current year's total equity to the prior year's total equity and dividing by two.

$$Return\ on\ Equity\ = \frac{Net\ Income}{Average\ Equity} \quad (4)$$

Source: (White et al, 2014)

A profit margin is a ratio that indicates the proportion of each euro or other cash that remains in the firm after expenditures are paid. Profit margin ratios indicate how well a business can control expenditures in comparison to revenues. Profit margin changes are explained by variables impacting a company's income and costs as shown in its income statement. Profit margins are

determined as a component of profitability ratios by dividing net income by total sales (Weygandt et al., 2015). One of the objective for companies is to have the highest Profit Margin possible (Owen A., 2013).

$$Net\ Profit\ margin\ = \frac{Net\ Income}{Net\ Sales} \quad (5)$$

Source: (Weygandt et al, 2015)

1.4. Solvency ratios

The financial structure of the firm illustrates how the working operations and the whole enterprise are financed. Essentially, there are two methods to fund a business: via internal capital or external money. During these periods, the firm must repay external money, which results in capital expenditures such as interest. The corporation is not required to repay its own stock, and dividends are not mandatory. The financial structure of a company, thus, indicates the organization's capacity to get over obligations in the long-term perspective of the business. If external capital constitutes a greater proportion of a firm's financial structure and the additional expenditures associated with external capital reduce the company's revenue, it is more probable that the company may suffer solvency issues during economic depressions. They are also known as leverage ratios, since they are used to determine a company's debt use (Henry et al, 2011). The author will evaluate the debt-to-equity ratio in this article.

The debt-to-equity ratio is calculated by dividing a company's total debt by its shareholder equity and is used to measure a company's financial leverage. A high debt-to-equity ratio implies a lack of solvency and might put a business in danger (Henry et al., 2011). A debt-to-equity ratio of one indicates that the company's debt and equity are equal. However, if it is very low, it may indicate that the corporation is restricting its development potential by avoiding debt, hence reducing shareholder returns (Samonas, 2015).

$$Debt\ to\ Equity\ = \frac{Total\ Debt}{Total\ Equity} \quad (6)$$

Source: (White et al, 2014)

1.5. Activity ratios

Activity ratios indicate the rate at which different accounts are transformed into sales or cash—inflows or outflows, respectively. Overall, activity ratios are used to assess how effectively a company performs across several dimensions, such as inventory management, disbursements, and collections (among other things). The activity ratio indicates how well a business manages its assets. Businesses make profits via the use of assets. If a business uses its assets inefficiently, its costs may rise and revenues may fall, affecting the company's financial performance. On the other hand, if a business succeeds in managing its assets more effectively, less capital is needed and expenses are better managed, resulting in a long-term rise in revenue (Sherman, 2015). A variety of different ratios are available for assessing the activity of the most essential current accounts, which comprise inventory, accounts receivable, and accounts payable. t is also feasible to analyze the use efficiency of total assets. In this article, two activity ratios, total asset turnover ratio and average collection period, will be investigated in order to assess the activity ratio of Visa and Mastercard, respectively.

Asset turnover is a metric that measures how efficiently a business uses its assets to generate revenue (Gitman, 2015). It is calculated as a percentage of total assets and indicates how many cents in revenue are earned for each euro spent on average assets. A greater turnover ratio indicates that the assets are more efficient. Additionally, it displays the total value of the company's assets (Brealey et al., 2001). Sales are divided by average assets in order to determine the total asset turnover ratio.

$$Assets\ Turnover\ Ratio\ = \frac{Sales}{Average\ Assets} \tag{7}$$

Source: (Brealey et al, 2001)

The average collection period activity ratio quantifies the length of the receivable and also indicates how quickly or slowly consumers pay their financial commitments to the organisation. It indicates how rapidly a business generates cash from sales. A short collection period suggests that receivables are being collected quickly and efficiently. Additionally, it indicates that the business has a stringent or very restrictive credit policy, which results in a drop in the number of prospective clients and vice versa (Brigham, E. F., & Houston, J. F, 2016).

$$Average\ Collection\ Period\ = \frac{Average\ receivables}{Average\ Daily\ Sales} \tag{8}$$

Source: (Brealey et al, 2001)

2. OVERVIEW OF NETWORK PAYMENT INDUSTRY

2.1. Industry overview

There have not been clear and consistent statistics regarding the global payments network business, in which MasterCard and Visa operate. Numerous sources have reviewed or analysed various aspects of the payments industry, including card payments (debit, credit, and prepaid cards), ATMs, and, more recently, fintech and other companies looking to leverage and capitalise on mobile payments innovation, as well as alternative payment methods offered by Wise and Square Inc. Nonetheless, unlike a little over a decade ago, when the industry was dominated by a few huge firms, the market is now dominated by a plethora of SMEs and large enterprises. Each of them offers consumers, both individual and business clients, a variety of handy payment options. As a result, the sector has become increasingly competitive, propelled by technological breakthroughs, and as such, its intricacy is hard to comprehend.

As reported by the Federal Reserve's 2020 Diary of Consumer Payment Choice study, 42 percent of Americans preferred using a debit card to pay their expenses, while 29 percent preferred to pay with a credit card, which means that 71% had at least one of the two (Laura Kim, Raynil Kumar, Shaun O'Brien, 2020). Many people have a lot of credit cards so that they can get the most rewards, cash back, and other benefits from the companies that make them. In the media, credit cards often take centre stage, with approximately $1 trillion in outstanding revolving credit balances by the end of the first quarter of 2021 (Federal Reserve System, 2022). According to the 2019 Federal Reserve Payments Study, debit cards, together with credit cards and other types of non-cash payments, accounted for about 174.2 billion payment transactions in 2018, totaling $97.04 trillion in total value (the most recent available) (Federal Reserve System, 2020).

As the financial technology industry expands, more prepaid card options are introduced to the market, generating approximately $294.44 billion in annual volume in 2020, representing a 38.1 percent increase over the previous year, no doubt fueled by the impending economic crisis in 2020. (The Nilson Report, 2021).

McKinsey's (McK) global payment reports 2021, mentioned the year 2020 without a question, was a turbulent year on several fronts. Payments were no exception, as the sector had its first

revenue decline in 11 years as a result of the economic downturn associated with COVID-19's worldwide health crisis. Nevertheless, government and regulatory actions such as fiscal and monetary assistance kept the decrease below the 7% forecast as of the 2020 study (Philip Bruno, Olivier Denecker, and Marc Niederkorn, 2020). Simultaneously, the growing digitalization of business and consumer interactions accelerated the rising trend even farther than predicted.

Global payment revenues totalled $1.9 trillion in 2020, a 5% fall from 2019, compared to a 7% increase between 2014 and 2019. According to McKinsey, global payments revenues will quickly return to their long-term growth trajectory of 6 to 7 percent in 2021, recouping the reductions seen in 2020 and reaching around $2.5 trillion by 2025 (Philip Bruno, Olivier Denecker, and Marc Niederkorn, 2021). On the surface, this conclusion seems straightforward; nonetheless, a more detailed examination reveals a number of sometimes contradictory tendencies. In general, the payments sector showed remarkable resilience in the face of adversity, despite the fact that many economies spent major sections of the year in lockdown.

According to Boston Consulting Group's (BCG) five-year forecast, global payments revenues would grow by a robust 7.3 percent between 2020 and 2025. Growth will stay roughly constant for the balance of the decade, with the entire revenue pool expected to reach $2.9 trillion by 2030. They also believe the pandemic also led to two big changes in global payments: cash-to-non-cash conversion and e-commerce adoption (Boston Consulting Group, 2021).

2.2. Visa Inc

Visa is a global financial services company based in Foster City, California. It is a global leader in the field of electronic payments. The main purpose of Visa is to connect the world's people, companies, and economies by providing the most creative, dependable, and secure payment network possible. Its breakthrough technologies enable worldwide commerce and money movement between consumers, merchants, financial institutions, corporations, key partners, and government organisations in more than 200 nations and territories. It enables electronic financial transfers worldwide, most often using Visa-branded credit cards, debit cards, and prepaid cards. Visa is one among the world's most valuable corporations. It has been in the business of enabling payments between consumers and companies since 1958 (Stearns, D. L., 2011). It has also developed into a worldwide firm that is a trusted engine of commerce, trying to offer payment solutions for everyone, everywhere, as a result of new payment methods. Visa's focus has been on extending, enhancing, and investing in our proprietary network, VisaNet, while also

exploring new ways to offer products and services and establishing a single point of connection for facilitating any payment transaction, whether it is conducted through our network, another network, or a combination of networks(Visa Annual Report, 2016). Visa provides tools and services that enable the safe, dependable, and efficient flow of money for all ecosystem players. When it comes to payment scenarios, Visa mostly focuses on those that occur from consumer to merchant, and it provides products and services that are based on this scenario, such as Visa Advertising Solution, which enables merchants to plan and manage their digital advertising campaigns. Visa primarily serves two types of customers: individuals (e.g., account holders and cardholders) and merchants. It is focused on the income generated by the company's processes connected to customer, merchant, and intermediary activities.

Visa enables financial institutions, merchants, and consumers to conduct safe, dependable, and easy transactions. Visa has referred to this approach as the "four-party" model in the past. Visa's model has been expanded to incorporate digital banks, digital wallets, a variety of financial technology businesses (fintechs), governments, and non-governmental organisations as the payments ecosystem continues to change. VisaNet, their sophisticated transaction processing network, allows them to provide transaction processing services (primarily authorization, clearing, and settlement) to their financial institution and merchant partners, as well as their own customers.A total of 232 billion payments and cash transactions were processed via the Visa brand during the fiscal year 2021. This is an average of 637 million transactions each day throughout the fiscal year 2021. In all, 232 billion transactions were handled, with 165 billion of those transactions being processed by Visa (Visa Annual Report, 2021).

Visa offers a diverse portfolio of Visa-branded payment products that are used by their 15,100 financial institution customers to create and supply key business solutions, such as credit, debit, prepaid, and cash access programmes for consumer, company, and government account holders. Visa's total payments and cash volume reached $13 trillion in fiscal year 2021, and 3.7 billion credentials were accessible globally for usage at more than 80 million merchant locations (Visa Annual Report, 2021). Visa is not a bank or a financial institution. They do not issue cards, extend credit, or establish rates and fees for Visa product account holders, and Visa does not generate income from or assume credit risk associated with any of these operations. Interchange reimbursement fees are crucial in balancing the costs and advantages of doing business with Visa in order to guarantee that both account holders and merchants benefit from participation in their payment networks. Typically, the acquirer collects and distributes reimbursement fees for

interbank transactions. Visa establishes default interchange reimbursement costs that apply when no additional settlement conditions are negotiated. Additionally, they do not generate money from acquirers' acceptance fees, which include the Merchant Discount Rate (MDR). In most cases, their acquiring clients are responsible for courting merchants as well as setting and collecting these fees.

To understand Visa's core business, let's go through an example of a typical Visa C2B payment transaction. The customer uses a Visa card or other payment instrument to buy goods or services from a business. The merchant submits transaction data to an acquirer for verification and processing, which is often a bank or third-party processing organisation that enables the acceptance of Visa cards or payment products. The acquirer submits the transaction data to Visa through VisaNet, and Visa contacts the issuer to confirm that the account holder's account or credit line is authorised. After authorising the transaction, the issuer essentially pays the acquirer the transaction's value, less the interchange reimbursement charge, and then deposits the transaction into the consumer's account. The acquirer pays the merchant the value of the transaction less the MDR (Visa Annual Report 2021, 5).

2.3. Mastercard

Mastercard Inc. is a multinational financial services corporation located in Purchase, New York. Its global operations headquarters are situated in O'Fallon, Missouri, a city in St. Charles County. Merchant banks and the banks or credit unions that issue debit, credit, or prepaid cards with the "Mastercard" brand are the principal customers of the corporation. Since 2006, when Mastercard Worldwide went public, the corporation has been a publicly traded enterprise (Stearns, D. L., 2011). In the years leading up to its first public offering, Mastercard Worldwide was a cooperative owned by the more than 25,000 financial institutions that issued the company's branded credit cards. In the global payments sector, Mastercard is a technology corporation that links customers, financial institutions, merchants, governments, digital partners, enterprises, and other organisations all over the globe, allowing them to use electronic forms of payment in place of cash and checks. MasterCard simplifies and expedites payments by offering a broad variety of payment solutions and services via its family of well-known and trusted brands, which include Mastercard®, Maestro®, and Cirrus® (Mastercard Annual Report 2019). The organisation operates a multi-rail payments network that gives consumers and

merchants choice and flexibility. They switch (authorise, clear, and settle) payment transactions using their own core global payments network. Additionally, they support automated clearing house ("ACH") transactions (both batch and real-time account-based payments). They provide integrated payment solutions and services and capture new payment flows by using these capabilities. Among its value-added services are cyber and intelligence solutions that enable all parties to deal simply and confidently, in addition to other services that deliver exclusive insights based on their principled use of consumer and merchant data. Their franchise model establishes standards and ground rules that balance value and risk for all stakeholders while facilitating interoperability. Their payment solutions are meant to assure the global payments ecosystem's safety and security.

Mastercard's highlights of 2021 financial and operational performance, including growth rates over the preceding year, are represented below:
Mastercard earned $9.5 billion in net cash flow from operations in 2021. Additionally, the company made acquisitions totaling $4.7 billion, repurchased 16.5 million shares of common stock for $5.9 billion, and paid $1.7 billion in dividends. Additionally, they conducted debt issues totaling $2.1 billion in principle. On a currency-neutral basis, net revenue climbed by 22% in 2021 compared to 2020, including 2 percentage points from acquisitions. The remainder of the increase was mostly attributed to the following:

- A 21 percent rise in gross dollar volume in local currency
- A 32 percent increase in cross-border volume, measured in local currency
- 25 percent rise in switched transactions
- Other sales climbed 32%, or 31% currency-neutral, including a rise of 8% related to acquisitions. The remainder of our increase came from our cyber and intelligence and data and services offerings.

Along with strong financial performance, Mastercard has a diverse workforce. Mastercard employs roughly 24,000 people worldwide as of December 31, 2021. Their workforce is mostly full-time, and approximately 65 percent of them work in more than 80 countries outside of the United States.Additionally, they employed around 3,900 contractors that complemented their staff base to satisfy special demands. As of December 31, 2021, their voluntary worker turnover (rolling 12-month attrition) was 11%. For the fiscal year ending December 31, 2021, the overall cost of their staff was $4.5 billion, which was mostly comprised of salaries, benefits, and other personnel and contractor-related expenditures (Mastercard Annual Report 2021, Page 17).

3. FINANCIAL RATIO ANALYSIS FOR MASTERCARD AND VISA (2016-2021)

3.1. Net revenue

We will analyse and compare chosen financial ratios for Visa and Mastercard from 2016 through 2021 in this chapter. It is critical to understand how Visa and Mastercard have performed financially in recent years, since the global economy had an influence on their financial performance during this period. The majority of financial ratios in this chapter are calculated using data from income and balance statements of Visa and Mastercard.

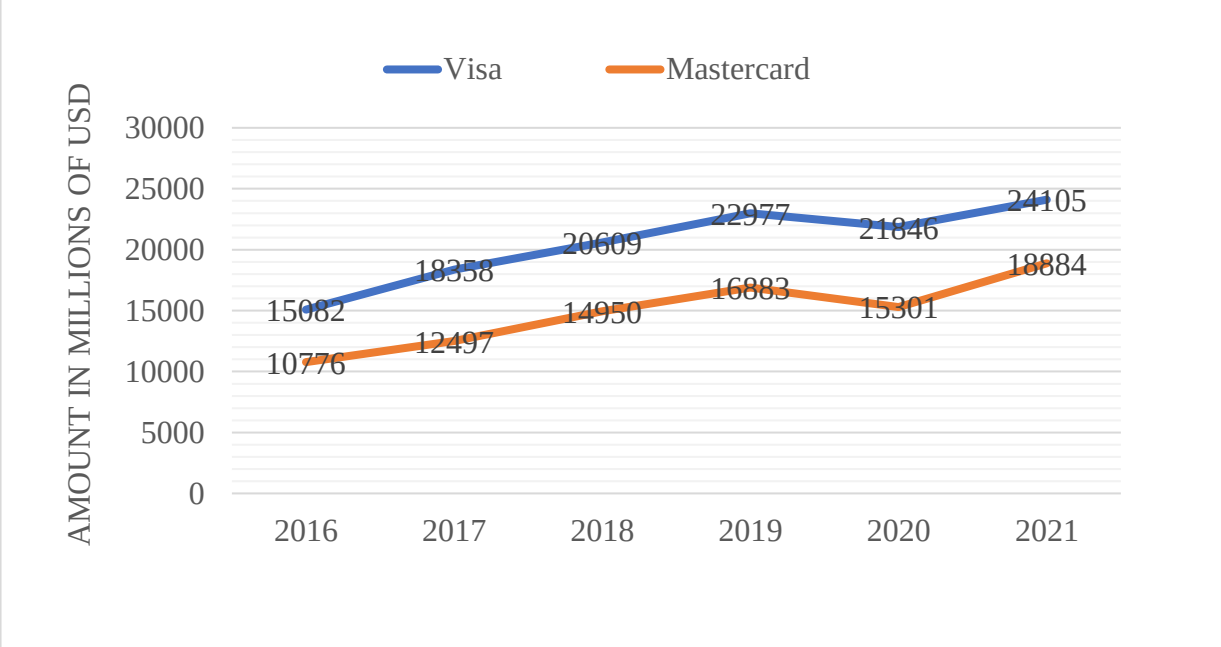

Figure 1. Net Revenue of Visa and Mastercard for 2016-2021 (Source: based on data from appendix 1 and 2)

The following are the revenue figures for the Visa´s and Mastercard´s operations during the previous six years. VISA's revenue has climbed by about $9023 million from $ 15082 million in 2016 to $24105 million in 2021, whereas Mastercard's revenue has increased by approximately $ 8108 million from $10776 million in 2016 to $18884 million in 2021. This is an increase of around 60% and 75% from the end of 2016 for both Visa and Mastercard, respectively. The results indicate consistent positive growth from 2016 to 2019, however in

2020, the revenue of Visa and Mastercard fell by about 5% and 9%, respectively, compared to the previous year. These decreases were mostly influenced by the worldwide spread of COVID-19 starting in later part of March 2020. However, revenue seems to have climbed significantly in 2021, reaching a new high of $24105 million for Visa and $18884 million for Mastercard, respectively. During fiscal 2021, net revenues climbed principally as a result of year-over-year growth in payments volume, processed transactions, and cross-border volume, which was aided by less COVID-19 restrictions.

Visa has always generated more revenue than MasterCard. This is because Visa's service revenue, data processing revenue, and cross-border revenue have increased significantly since the acquisition of Visa Europe in 2016. The other primary reason Visa's net revenue increase was that it was able to maintain lower client incentives than Mastercard over the years. Client incentives in this case include long-term contracts with financial institution clients, merchants, and strategic partners for a variety of programmes aimed at increasing payment volume, product acceptance, and innovation. In most cases, these client incentives are deducted from gross revenue, thereby decreasing net revenue. According to the Nilson report, Visa accounts for approximately 60% of total transaction volume in 2020, while Mastercard accounts for only 36% of the same. The remainder was split between American Express, JCB, and Diners Club and others (The Nilson Report, 2021). This is also one of the reasons why Mastercard introduces new client incentive programmes to increase market share, which increases the amount of rebates and incentives and ultimately reduces Mastercard's net revenue.

Across all years, Visa's other revenues are less than a third of those of Mastercard. This is generally because Visa's other revenues consist of a limited number of service fees, such as fees for value-added services, licence fees for the use of the Visa brand, account holder service fees, certification fees, licencing fees, and other product enhancement service fees (Visa Annual Report 2020, page 45). Whereas Mastercard, in comparison to Visa, includes a broader range of service fees in this other revenue section, including cyber and intelligence solutions fees, data analytics and consulting fees, loyalty and rewards solutions fees, foreign exchange margin, commissions, load fees, ATM withdrawal fees, etc. (Mastercard Annual Report 2021, page 78). The horizontal analysis in this study was conducted over a six-year period, from 2016 to 2021, using financial information from Visa and Mastercard obtained from the companies' annual reports published on their websites. Horizontal analysis is the comparison of two or more financial statements or specific components of a financial statement (Scott, 2003). The time

period chosen aids in comprehending the company's previous and present financial status. Additionally, it aids in making financial projections for the following years.

3.2. Liquidity ratio analysis

The current and quick ratios are used to evaluate Visa and Mastercard's liquidity. These ratios are used to evaluate the two network payment processor companies' ability to pay their short-term debt obligations or those obligations that are due within one year.

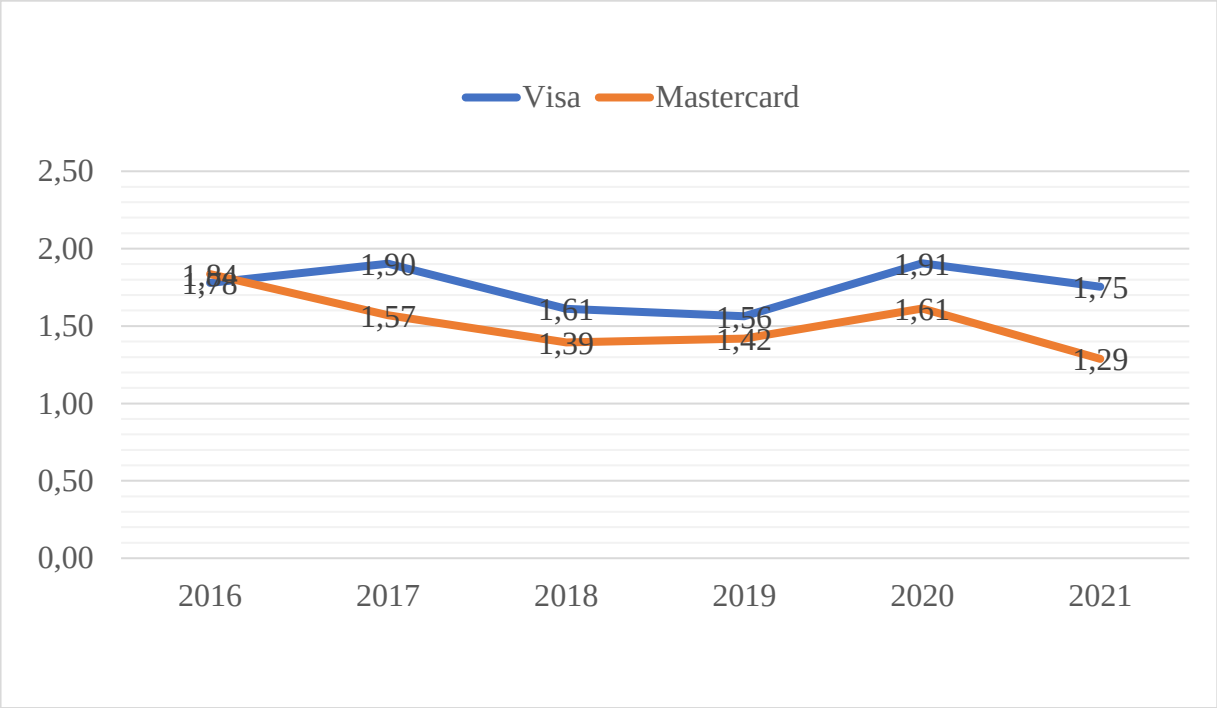

Figure 2. The current ratio for 2016-2021 (Source: based on data from appendix 3)

For the entire selected period, the current ratios of Visa and Mastercard are greater than one. It means that both companies have enough short-term assets (cash, inventory, or receivables) to cover their current or short-term liabilities. In 2017, Visa's current ratio increased dramatically from 1.78 to 1.90, compared to 1.78 in 2016. It is due to an increase in cash and cash equivalents from $561 million in 2016 to $9874 million in 2017. According to Visa's 2017 Annual Report, the increament was caused by revisions to the consolidated statements of cash flows made to correct a gross investment activity presentation error. Purchases and revenues from maturities, as well as sales of investment securities, were reduced by $1760 million, from $2800 million and $2670 million, respectively, to $1040 million and $9100 million. For financial reporting

purposes, these securities should have been reported as cash and cash equivalents rather than gross investment activity, and thus added to cash and cash equivalents. It can also be seen that the current ratio increased unexpectedly from 1.56 in 2019 to 1.91 in 2020. Again, this is due to an increase in cash and cash equivalents in 2020 of $8451 million, primarily due to proceeds from the issuance of senior notes. Mastercard, on the other hand, has a significantly lower current ratio in the year 2021 when compared to other selected periods, owing to a decrease in cash and cash equivalents of $2692 million from the previous year. The current ratios for Mastercard in 2017, 2018, and 2019 had minor ups and downs due to changes in customer settlement and accrued expenses, but the same for 2020 had a significant increase in cash and cash equivalents of $3125 million, which gradually increased the current ratio from 1,42 in 2019 to 1,61. Both companies' current ratios have always been greater than one during the chosen period, indicating that they are in good shape and are less likely be exposed to financial problems to pay their short term obligations in coming years.

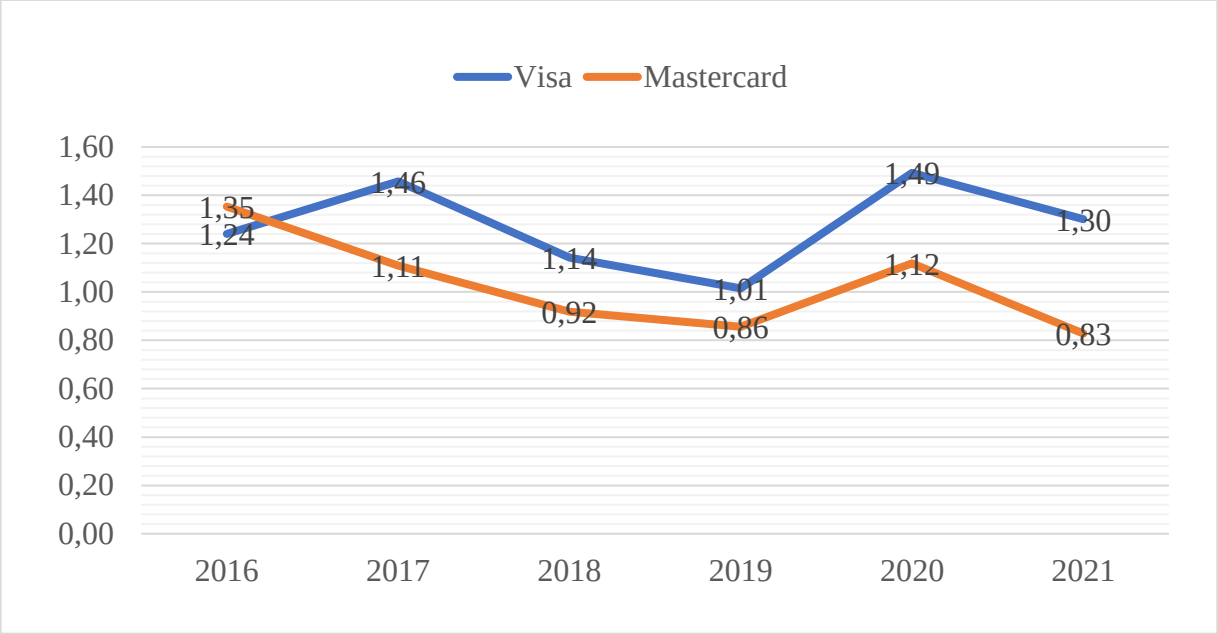

Figure 3. Quick ratio for 2016-2021 (Source: based on data from appendix 3)

The quick ratio reflects an organization's ability to repay short-term loans and obligations using only its most liquid assets. A quick ratio greater than one is universally regarded as more liquid. Unlike the current ratio, Mastercard's quick ratios for 2018, 2019, and 2021 are less than one, indicating that for every dollar of current debt, Mastercard has less than one dollar in liquid assets to pay it off during those three years. As explained in the current ratio, Visa's shortfall in quick ratio between 2017 and 2020 was a result of a shortfall in cash and cash equivalents in

these years. Visa, in comparison to Mastercard, has a stronger financial position in terms of liquidity, with an average quick ratio of 1,27 over the last six years from 2016 to 2022, compared to Mastercard's 1,03 over the same period. From the ratios above, we can conclude that both companies performed better, but Visa is more financially sound than Mastercard in terms of liquidity.

3.3. Profitability ratio analysis

The profitability analysis of Visa and Mastercard will use the Return on Assets (ROA), Return on Equity (ROE), and Net Profit Margin ratios. It quantifies and analyses a company's ability to produce profit in relation to its revenue, assets, and equity during a specified time period between 2016 and 2021.

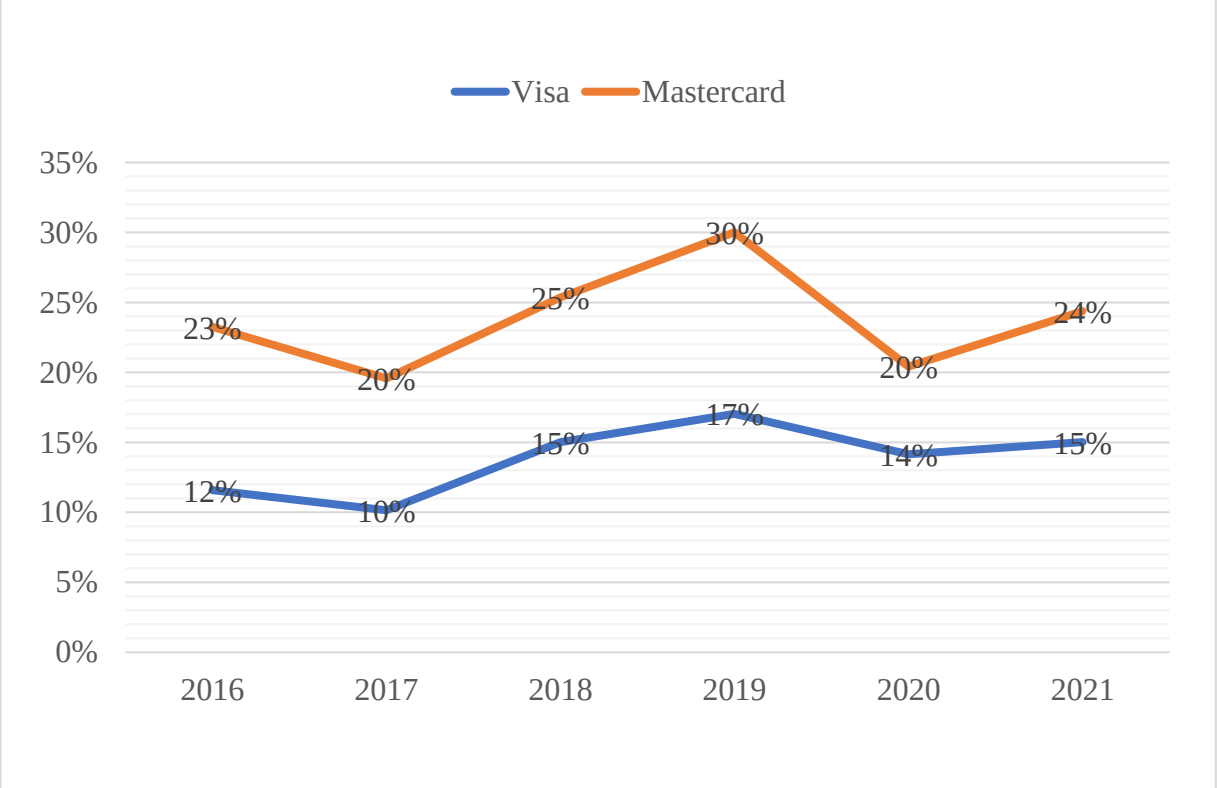

Figure 4. Return on Assets 2016-2021 (Source: based on data from appendix 3)

The following chart demonstrates that Mastercard has consistently had greater ROA values than VISA. This suggests that Mastercard's assets are being used more effectively than Visa's. Visa's current twelve-month return on assets for 2021 is 15%, while Mastercard's is 24%, representing

a 1% and 4% increase over the previous year for Visa and Mastercard, respectively. This increase is due to an increase in net sales of 10% and 23% from 2020 to 2021 for Visa and Mastercard, respectively, which resulted in an increase in net profit of $1445 million and $2276 million. Even with 10% revenue growth and associated net profit growth, Visa's ROA improved by just 1%, owing to the fact that VISA's average assets increased more than Mastercard's. As illustrated in the figure, both companies' ROAs move in almost the same direction. Mastercard's return on assets averaged 24.0 percent from 2016 to 2021, while Visa's was 14 percent. VISA's ROA is lower than Mastercard's due to the higher value of average assets, despite the fact that Visa's net income has always been higher than Mastercard's over the selected period of 2016-2021. Both Visa and Mastercard were able to increase ROA in 2019, which is extremely positive and shows an improvement in management of assets. This means that for every dollar invested in assets, they generate 17 and 30 cents of net income, respectively, which appears to be the peak values during the selected period of 2016-2021. In 2020, the return on assets (ROA) for both enterprises dipped as compared to that of previous year, but this is not due to poor management or money losses; rather, it is due to the direct impact of the coronavirus pandemic on the company's revenue.

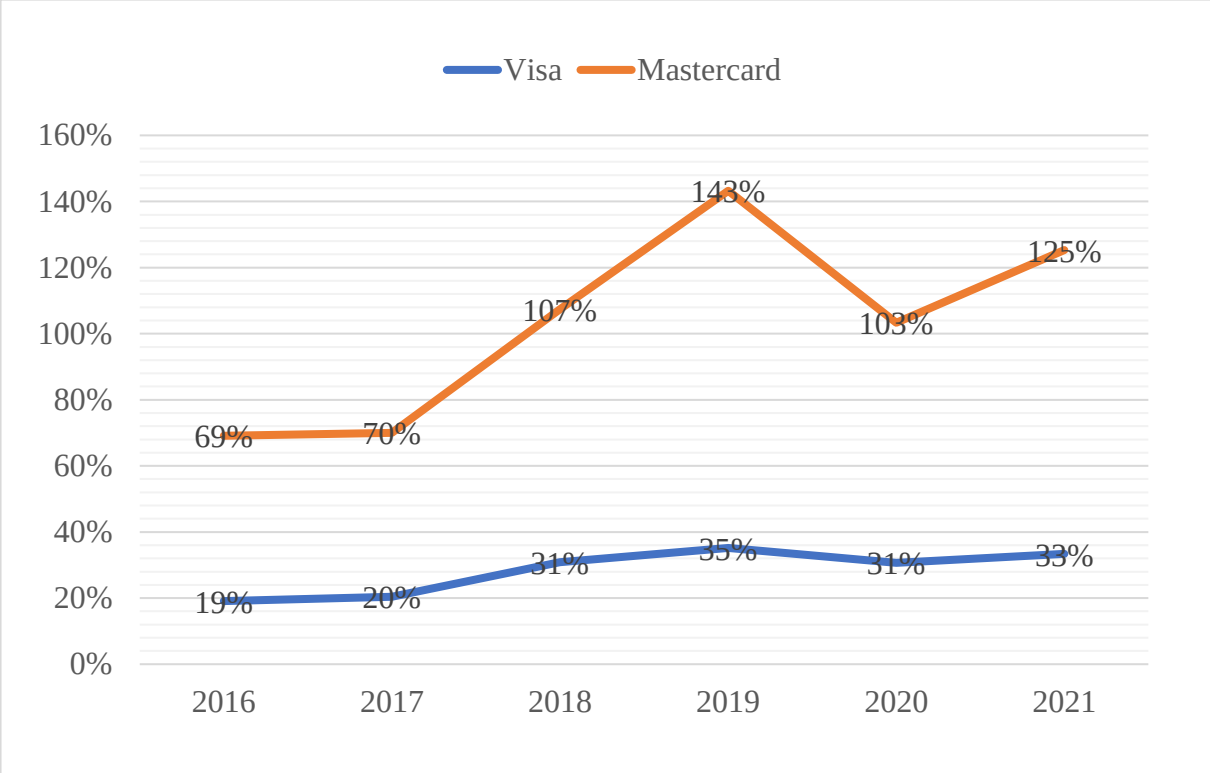

Figure 5. Return on Equity 2016-2021 (Source: Based on data from appendix 3)

ROE grew from 2016 to 2019 for both Visa and Mastercard, reaching a 6-year high in 2019. This indicates that both firms made more profits from their equity in 2019 (35 percent and 143 percent for Visa and Mastercard, respectively) than in any other year between 2016 and 2021. This implies that for every US dollar invested by Visa and Mastercard shareholders in 2019, they produced income of 35 US cents and 1,43 US dollars, respectively. From 2017 to 2019, Mastercard's ROE more than doubled, increasing from 70% to 143 percent in just three years. Whereas Visa experienced a modest but significant 15% increase in revenue from 20% to 35% during the same period. The primary reason for this growth is that revenue increased by 25% and 35% for Visa and Mastercard, respectively, from 2017 to 2019. This growth resulted in an increase in net income, which increased from $ 6699 million to $12080 million and from $ 3915 million to $8118 million for Visa and Mastercard, respectively. Similarly to ROA, both companies' ROE in 2020 decreased from the previous year, however this is owing to the direct impact of the coronavirus pandemic on the company's turnover, rather than bad management or money losses. However, we can conclude that, in terms of return on assets (ROA) and return on equity (ROE), Mastercard is regarded more profitable than Visa. Furthermore, it is also analyzed that there has been a significant difference in leverage between the Visa and Mastercard.

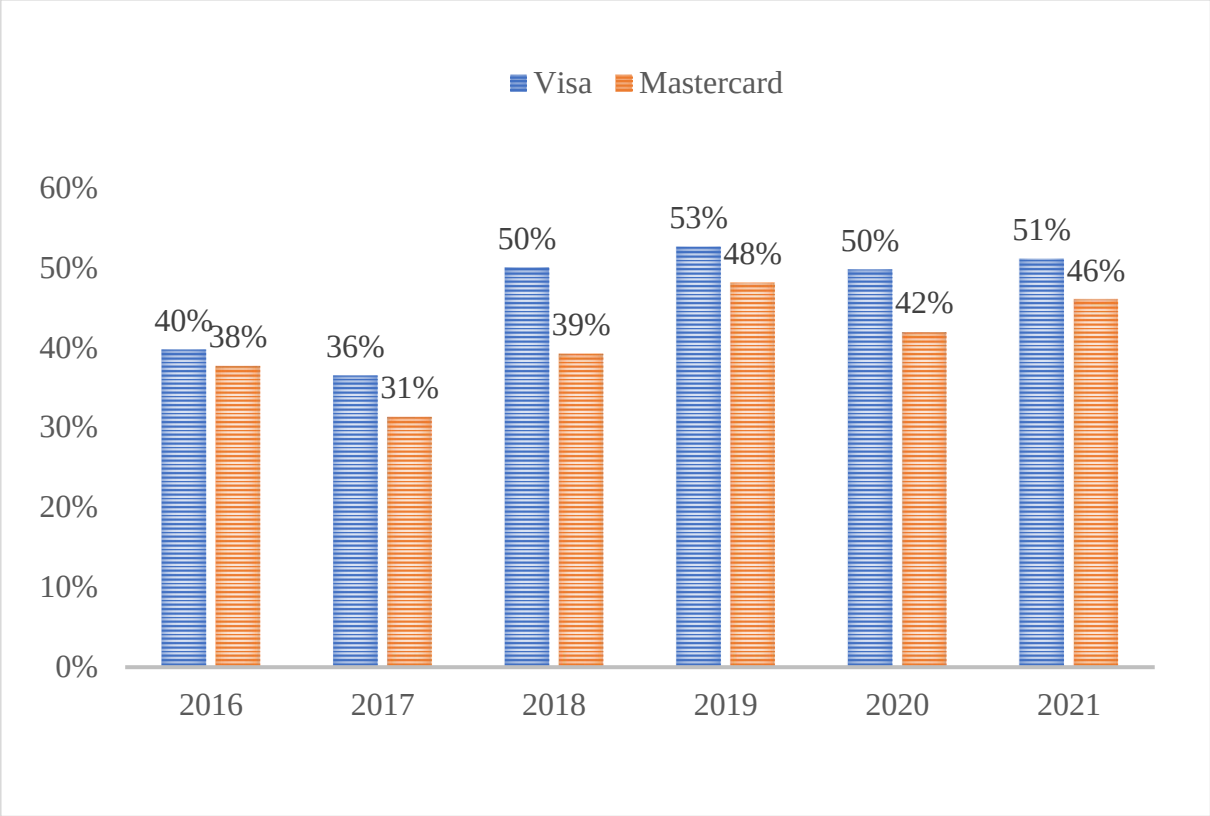

Figure 6. Net Profit Margin 2016-2021 (Source: based on data from appendix 3)

Visa's profit margins have been relatively steady over the last four years. In compared to its rivals, Mastercard, it indicates that a firm is successful and has some control over its expenses. In 2021, Mastercard's profit margin was 46 percent, which is still lower than Visa's. They do, however, show how near Mastercard is to a Visa's market position. Profit margin results show how much of an influence operational expenditures have on total net income for both firms. Primarily, it is crucial in contrast to the performance of Visa with Mastercard in the year 2021, when Visa obtained a net profit margin of roughly 51 percent. It indicates Visa's huge industry advantage over Mastercard. Visa has earned high operating revenue as compared to that of Mastercard of the selected period of 2016-2021. Visa was also able to reduce its expenditures, resulting in a higher net profit than Mastercard during the previous six years. The primary advantage for visa was that they were able to keep rebate and incentive costs significantly lower than Mastercard (which directly reduced gross revenue), which was also one of the key factors in Visa outperforming mastercard in terms of net profit margin over the selected period of 2016-2021. Visa's net profit margin has consistently been greater than Mastercard's throughout the previous six years, with an average net profit margin of 47 percent for Visa and 41 percent for Mastercard for the same period of 2016-2021. This also means that over the last six years, Visa and Mastercard earned a profit of 47 cents and 41 cents on every US dollar generated by sales, respectively. Hence, we can conclude from the comparison of net profit margins for Visa and Mastercard that both companies performed very well in terms of profitability. Having said that, it should be noted that throughout the course of the previous six years, Visa has outpaced Mastercard.

3.4. Solvency ratio analysis

The debt-to-equity ratio is used to assess Visa and Mastercard's solvency ratios. This ratio assists in determining the capacity of chosen companies to satisfy their long-term debt commitments as well as the financial statibility of these network payment processing companies over the long run.

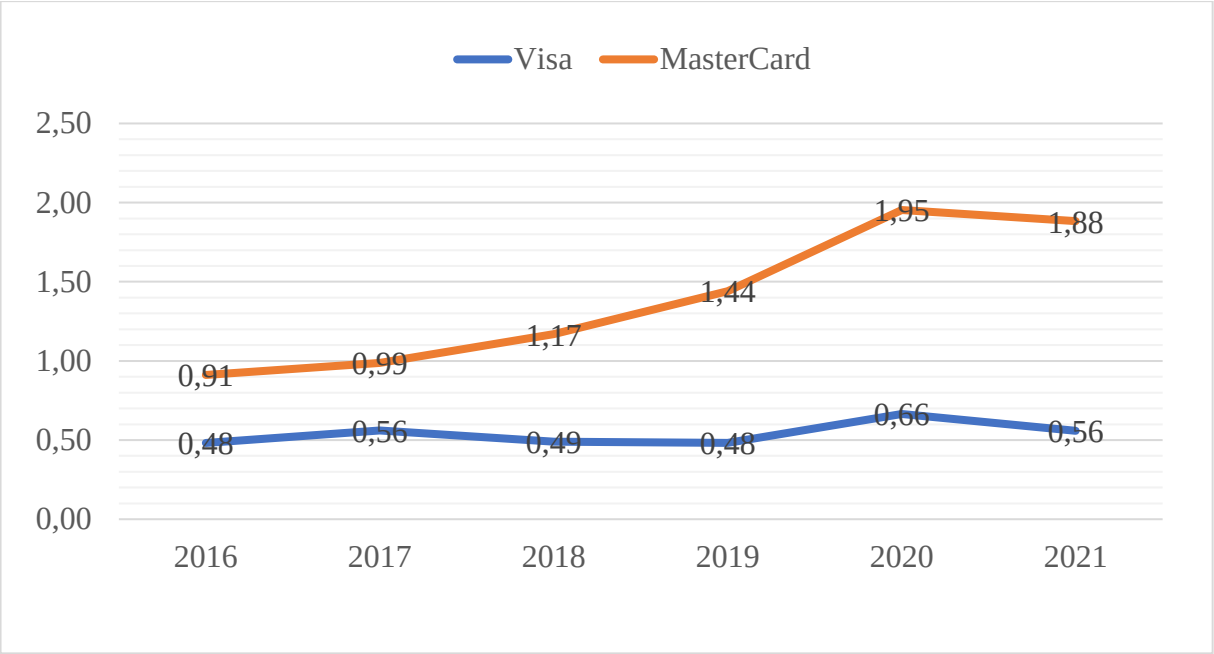

Figure 7. Debt to Equity ratio 2016-2021 (Source: based on data from appendix 3)

As seen in the graph above, the debt-to-equity ratios calculated based on interest bearing liabilities of the two corporations under examination are diametrically opposed. At the end of 2016, Visa had total debt of $15882 millions, total shareholder equity of $32912 millions, and a D/E ratio of 0.48. On the other hand, Mastercard had total debt of $5180 millions and total shareholder equity of $5684 millions, resulting in a D/E ratio of 0.91 over the same period. Visa continuously maintained a D/E ratio below one between 2016 and 2021, while Mastercard's D/E ratio increased year after year throughout the time under review. On the surface, it seems as if Mastercard's larger leverage ratio entails more risk. Nonetheless, this may be too inaccurate to be useful at this stage, necessitating a more exhaustive examination. Visa's D/E ratio has been consistent with the industry benchmark of 1. On average, 0.54 is the D/E ratio, ranging between 0.48 (lowest) and 0.66 (highest) between 2016 and 2019. This demonstrates Visa's optimum D/E ratio and hence demonstrates the company's excellent capacity to settle entire debts in the worst-case situation as well. Visa's highest ratio of 0.66 in 2020 was mostly owing to a huge increase in debt of 43.88 percent, but only a 4.40 percent increase in shareholder equity. In 2020, Visa saw a record-breaking rise in total debt. In 2021, Visa quickly lowered total debt to $20977 millions from $24070 millions, which lowered the ratio to 0.56 at the end of that year.

Mastercard's D/E ratio has been steadily rising, going from 0.91 in 2016 to 1.95 in 2020. For 2017, 2018, 2019, 2020, and 2021, Mastercard's total debt fluctuation percentages were 4.71

percent, 16.78 percent, 34.62 percent, 48.61 percent, and 9.70 percent, respectively. This indicates a significant increase in overall debt until the end of 2020. However, the proportion of shareholders' equity that has fluctuated over the same period of time has been -3.29 percent, -1.44 percent, 9.21 percent, 9.65 percent, and 13.79 percent for 2017, 2018, 2019, 2020, and 2021, respectively. This demonstrates the diverging increment relationship between total debt and shareholder equity, which resulted in Mastercard's D/E ratios being above one in four of the six periods considered.

3.5. Activity ratio analysis

The asset turnover ratio and average collection period are used to examine the activity ratio, which aids in determining how effectively Visa and Mastercard utilise their assets to create revenue and cash. It may be said that if assets are not utilised effectively, expenses would rise, resulting in financial hardship.

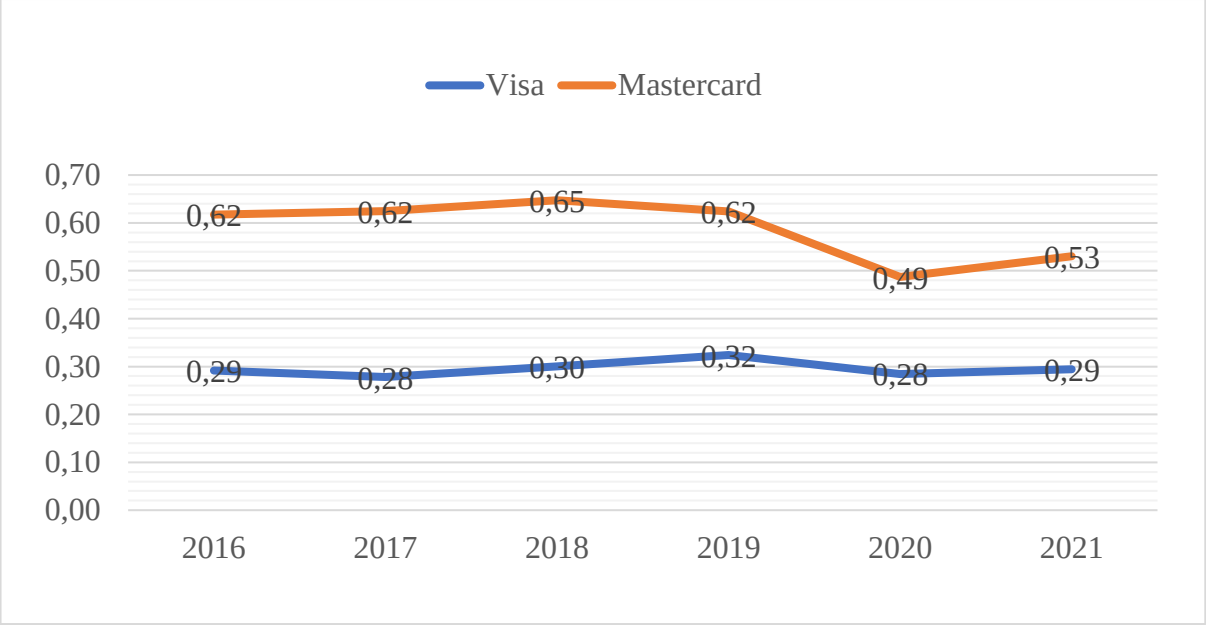

Figure 8. Assets turnover ratio 2016-2021 (Source: based on data from appendix 3)

The graph above illustrates Visa and Mastercard's asset turnover ratios for the years 2016–2021. Before jumping into the explanation, we can see the huge variance in average assets base of Mastercard and Visa. Visa's average assets were $51701 million in 2016, with optimum annual growth leading to an average asset base of $81908 million in 2021. On the other hand,

Mastercard's average asset base was substantially less than Visa's. Mastercard's average asset base ranged between $ 17463 millions and $ 35627 millions between 2016 and 2021. Visa's asset turnover ratio has been stable throughout the years, fluctuating between 0.28 and 0.32. However, tendency of Mastercard was quite inconsistent as compared to Visa, ranging between 0.49 and 0.65. This demonstrates that Mastercard's approach is sufficiently efficient in terms of producing sales from its asset base, Visa's lower assets turnover ratio depicts inefficient assets utilization despite having substantial average assets base. Both Visa and Mastercard reported a modest fall in their asset turnover ratios in 2020, which was most likely related to the effect of the COVID-19 Pandemic. Net revenues for both firms, Visa and Mastercard, declined by 5% and 9%, respectively, over the period. Visa's assets have grown faster than its revenue, but Mastercard's asset turnover ratio shows that both assets and revenue have grown at the same rate over the years.

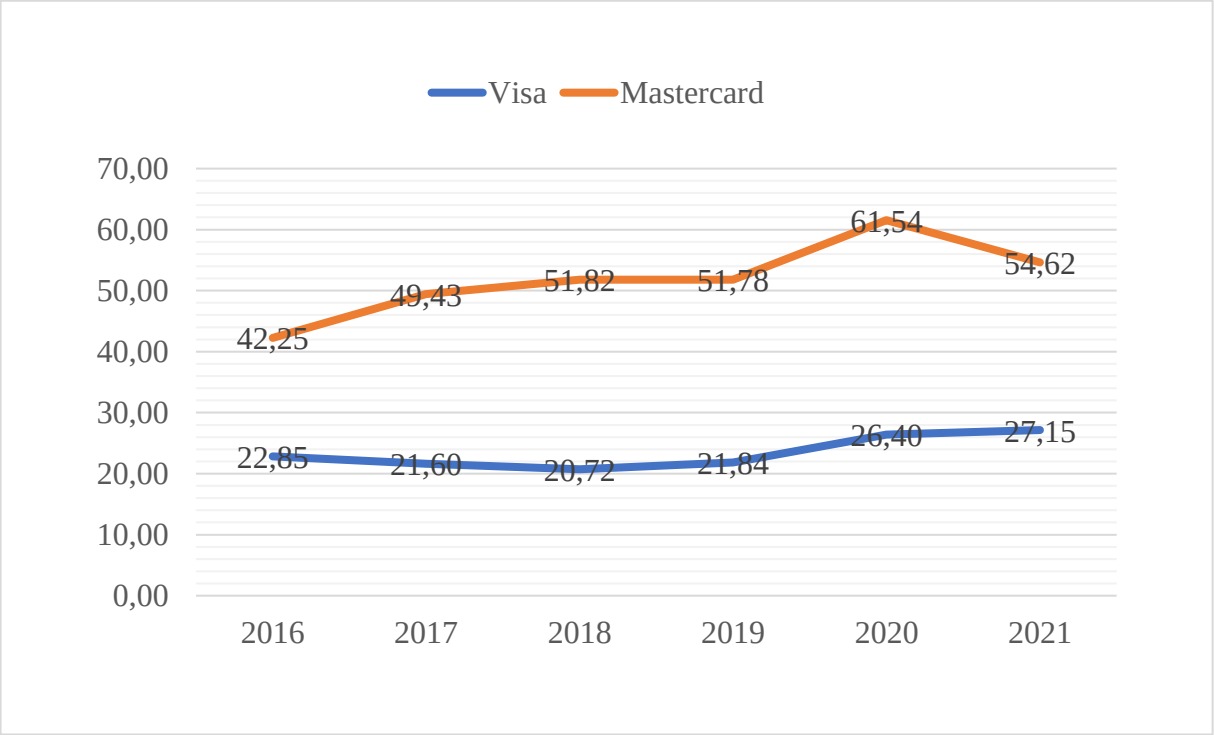

Figure 9. Average collection period 2016-2021 (Source: based on data from appendix 3)

As seen in the graphical presentation above, Visa's average collection period looks impressive, with the ability to collect accounts receivable with a substantially lower collection period of 21 to 28 days. It is also analyzed the credit policy of Visa is quite aggressive. On the other hand, Mastercard's average collection period ranged from 43 to 62 days. With a shorter collection period, Visa implies higher liquidity and ensures strong cash flows to take care of its near-term

financial responsibilities. In contrast, with a longer average collection period, Mastercard must make significant efforts to maintain liquidity and plan for future costs. Though, its upto Mastercard's credit policy, but it is expected having a lower collection period could help Mastercard to collect receivables efficiently. The average collection period for Visa was 23 days during the year 2016 and gradually decreased until 2018, resulting in a 21 days average collection period. However, the tendency reversed back then and has been increasing significantly until the end of 2021, with an average collection period of 27 days and an average account receivable of $1793 million, which was $1580 million at the end of last year ended 2020. Thus, the accounts receivable figure in 2021 shows the increment of accounts receivable by 90% as compared to the initial period of comparison, i.e., 2016. However, during the same period, average daily sales increased by 60.97%. This incremental gap between the two factors resulted in a continuous increment in the average collection period. Still and all, Mastercard's average collection period in 2021 sequentially improved by 7 days, resulting in an average collection period of 55 days, up from 62 days in 2020. Consequently, from the above analysis, it can be concluded that Visa can make effective decisions on paying its short-term debt because of having a lower account collection period and might have a systematic and scientific tracking mechanism for debt collection. Even though Mastercard's average collection period is getting better, it is expected that the company's accounts receivable policy will need to be revisited and a new strategy put in place.

3.6. Discussion

As both the companies are listed at the stock exchange, it is quite imperative to check how these companies are valued at stock market. While conducting a price-to-earnings ratio (P/E) analysis, Visa was trading at approximately 39 times earnings at the end of 2021 (Morningstar, accessed on 2022), while Mastercard was trading at 44,2 times earnings (Morningstar, accessed on 2022). Thus, the P/E ratio of Visa and Mastercard was greater than that of the S&P 500, which averages approximately 25 times earnings at the end of 2021. Also, while analyzing price-to-book ratio (P/B), Visa's P/B ratio was overvalued than that of the S&P 500 which were 13,6 and 4,6 at the end of 2021. Whereas the same for Mastercard was surprisingly higher valued at 52,6 at end of 2021(Morningstar, accessed on 2022).

Thus, to summarise the research findings, both corporations achieved the highest revenue over the past six years in 2021, owing to the global recovery from the covid pandemic. The main reason for visa's net revenue higher was mostly due to its ability to retain lower client incentives than Mastercard throughout the years. Both companies are highly profitable, as evidenced by their net profit margins. Visa and Mastercard are two of the most profitable companies in the network payment processor industry in terms of net profit margin. In the most recent year's results, Visa and Mastercard had net profit margins of 51% and 46%, respectively, followed by Discover Financial Services with a profit margin of 45,91% (Yahoo finance, Accessed on 2022) and American express with a profit margin of 18,40% (Yahoo finance, Accessed on 2022) , the two other larger companies in the network payment processing sector.

The paper's first research question was "How could financial ratio analysis be used to analyse and evaluate the financial performance of the network payment processor companies?" According to the financial ratio analysis and the author's perspective, utilising and comparing financial ratio analysis on network payment processing companies appeared to be quite beneficial. This thesis analyses and compares two network payment processing firms' liquidity, profitability, solvency, and activity ratios. And it indicates indisputably that financial ratio analysis effectively shows network payment processing enterprises' financial performance in terms of profitability, debt management, along with equity and asset management. Due to the fact that both Visa and Mastercard follow US GAAP, the applicable financial statements provided in their respective annual reports serve as the basis for analysing the financial ratios. Ratios are just numbers that are meaningless unless they can be comprehended and compared. By computing eight distinct financial ratios for Visa and Mastercard and comparing them to one another using a horizontal analysis for the years 2016–2021, the authors illustrate how financial ratios may be utilised and analyzed. This thesis helps in gaining a better understanding of the company's liquidity, profitability, asset management, capital structure mix, and capital requirements.

To answer the second research question “What is the market share of Mastercard and Visa at revenue segment levels?” Visa is the revenue-generating leader in the network payment processing industry, followed by Mastercard and other firms in this sector. Visa accounts for around 60% of total transaction volume in 2020, while Mastercard accounts for just 36% of the same. The remainder was split between American Express, JCB, and Diners Club and others. Talking about Visa and Mastercard, VISA's revenue has increased by approximately $9023 million since 2016, rising from $ 15082 million in 2016 to $24105 million in 2021. By contrast,

Mastercard's revenue has increased by approximately $ 8108 million, rising from $10776 million in 2016 to $18884 million in the same year. In terms of Visa and Mastercard, this represents an increase of almost 60 percent and 75 percent, respectively, since the end of 2016. So, we can conclude both the companies are financially sound and has great prospects of growth in terms of revenue.

To answer the third research question "By examining financial ratios, how do we determine which company (Visa or Mastercard) is performing well?" Visa is a network payment processor company with a larger market share and income than Mastercard, another competitor in this payment processor industry. By studying and comparing all of the financial ratios calculated, the author believes that Visa has a consistent financial performance. Based on financial statements and financial ratios calculated for the years 2016-2021, Visa can be considered a more liquid company with better financial performance than Mastercard. Although Mastercard has the highest asset management and the highest return on assets, Visa can be considered a more liquid company with better financial performance than Mastercard since it generates greater revenue and profit margin..

To answer the final research question, " What is the financial performance of these companies in terms of profitability, liquidity, debt management, asset management, and Solvency?" according to the calculations in Chapter 3, both Visa and Mastercard have a liquidity ratio greater than one, i.e., the average current ratio and quick ratio for both companies are greater than one, indicating that both companies are liquid. However, if we compare the same result between Visa and Mastercard, we can conclude that Visa is more liquid than Mastercard. The ability to meet the company's short-term financial obligations increases when the company has a higher liquidity ratio. For the last six years, both companies have maintained a positive profit margin, with Visa consistently earning more profit than Mastercard due to its higher volume of revenue and lower spending on client incentives and rebates. Prior to the COVID pandemic, both Visa and Mastercard had the highest profit margins in the year 2019. Mastercard's profit margins have always been lower than Visa's, owing mostly to increased market competition and higher operational costs. Each company's primary objective is to make as much profit as possible, and both Visa and Mastercard have successfully maintained a positive profit margin during the 2016–2021 time period. Mastercard has the highest asset turnover ratio when compared to Visa, indicating that Mastercard's assets have been used and managed more efficiently, generating more sales per dollar invested in their assets. Mastercard's average collection period is also longer than Visa's, indicating that Mastercard has a loose credit policy or payment terms that could flag potential difficulties in converting revenue into liquid cash.

Visa may be regarded as a risk-free investment due to its debt-to-equity ratio of less than one. This indicates that for every unit of equity, there is less than one unit of debt. However, Mastercard's debt-to-equity ratio has been more than one during the previous four years, indicating that creditors of Mastercard outnumber investors in the company's assets, which is a poor indicator of the company's financial performance.

3.7. Suggestions

The author of this thesis makes some suggestions based on the ratio analyses that were done for both companies. These suggestions could help both businesses be more profitable and more liquid, as well as better manage their assets and debts.

Visa, being in a strong profitability position, could focus on expanding its service revenue by focusing on new innovative products. It could also raise debt beyond what it has been maintaining currently, as its average debt to equity ratio for the last 6 years was 0,54, which could be raised to 1, which indeed will increase its interest expense, while the new innovation will still help in managing lower operational expenditures for even higher profitability. When it comes to Mastercard, since its primary weakness is now its excessive rebates and incentives, it should try to bring them down through a change in its marketing structure. For the activity ratio, Mastercard should come up with a revised account receivable policy and should implement a new strategy that will help the company reduce its average collection period and ultimately boost its ability to collect its receivables quickly. Visa's solvency analysis showed that it was in good shape, with enough earnings to cover its interest expenses and the ability to pay its debts with shareholders' equity. Since Mastercard appears to be overly reliant on debt, more research should be conducted, and the company's equity and asset management should be examined in greater depth. Additionally, the company should develop a debt restructuring strategy in the near future. However, the revenue segment shows that both companies are in good financial shape, and it is recommended that they focus on developing innovative products to outperform other payers in their field.

CONCLUSION

Visa and Mastercard focus on connecting customers and businesses primarily via the provision of innovative and secure payment solutions. These firms have effectively functioned and represented one of the network payment processing industry's pioneers, particularly in the card system platform. However, during the last six years, the sector has grown at a breakneck pace, changing its tendencies and affecting the company's relationships with its consumers. One of the current developments in the digital payment sector is represented by financial technology ("fintech") businesses that provide alternative financial services that are mostly or entirely reliant on the internet to deliver goods and services to their customers. It broadens the industry's borders, resulting in increased competition from a variety of new entrants, including non-bank payment services, financial consultants, and e-landing. This market exhibits a considerable strategic change away from traditional card systems and toward alternative digital payment methods and applications, such as mobile payment platforms or apps. The primary objective of this paper, therefore, is to analyze the financial performance of Visa and Mastercard in order to comprehend the current financial situation of this industry, as well as to analyse and compare the estimated financial ratios for the chosen period of 2016-2021. The financial analysis of both companies was conducted using eight distinct financial ratios.

When we examine the last six years, Visa has consistently outperformed Mastercard in terms of net profit margin, owing to Visa's ability to manage its operating expenses more efficiently with respect to the net revenue. In terms of liquidity, Visa has maintained a stronger financial position over the time period studied. Except for 2016, Visa's current and quick ratios have consistently outperformed Mastercard's over the last five years and can be concluded that Visa is more financially sound in terms of liquidity than that of Mastercard. Activity wise, Visa has better average collection period, indicating that its capacity to recover receivables is less than one month during the selected time period, but Mastercard's average collection period is approximately two months for most of the selected time period. Nonetheless, Mastercard's asset turnover ratio is much higher than Visa's. Mastercard's asset utilisation is more efficient with greater asset turnover, and it can create more sales per dollar invested in assets, which is vital in the network payment sector. Mastercard has maintained a pattern of improving efficiency and asset turnover throughout the years. Despite less effective asset usage, Visa has been able to maintain a more liquid and lucrative position than MasterCard due to its shorter collecting time.

Mastercard has performed significantly better than Visa when comparing Return on Assets and Return on Equity, as Mastercard has been able to maintain lower asset and equity values than Visa, which is also one of the core reasons for Mastercard's excessive reliance on debt, and has a direct impact on its debt to equity ratio, as Visa appears to be more solvent than Mastercard when we consider debt to equity ratio, as Visa has been able to maintain its debt to equity ratio below one over the period of 2016 to 2021.

This research has certain limitations related to the financial ratio analysis used to evaluate Visa and Mastercard's performance. We must use appropriate ratios and financial indicators to accomplish a decent and accurate performance review. That is to say, the data must be right, or the computations will be inaccurate. According to the company's annual report, the financial ratios are determined. Some of the data presented could be modified by the company's management team to make it seem as if they are doing well, making money and having a stronger financial position than they really are. Consequently, the outcome may not be genuine and accurate, and hence may not offer an accurate analysis. Sometimes, it is difficult to locate the data necessary to compute the ratios, like weighted average number of outstanding shares might vary along with common shareholder equity, market value of shares, interest costs etc. As a consequence, doing a comprehensive ratio analysis and comparing it between two companies would be challenging.

The author suggests that the findings of this paper be used to conduct additional in-depth comparisons with other network payment processing companies or as targets for other companies to meet, as Visa and Mastercard are considered market leaders, followed by Discover financial services and American express. It would be interesting to take this study a step further and look at how fintech startups may pose a threat to the network payment processing industry sector in general.

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APPENDICES

Appendix 1. Income statement and Balance Sheet of Visa 2016-2021

CONSOLIDATED STATEMENTS OF OPERATIONS *fig in Millions $*

Particulars	2016	2017	2018	2019	2020	2021
Operating Revenues						
Service revenues	6747	7975	8918	9700	9804	11475
Data processing revenues	6272	7786	9027	10333	10975	12792
International transaction revenues	4649	6321	7211	7804	6299	6530
Other revenues	823	841	944	1313	1432	1675
Client incentives	-3409	-4565	-5491	-6173	-6664	-8367
Net operating revenues	**15082**	**18358**	**20609**	**22977**	**21846**	**24105**
Operating Expenses						
Personnel	2226	2628	3170	3444	3785	4240
Marketing	869	922	988	1105	971	1136
Network and processing	538	620	686	721	727	730
Professional fees	389	409	446	454	408	403
Depreciation and amortization	502	556	613	656	767	804
General and administrative	796	1060	1145	1196	1096	985

Source: Visa Annual Report 2016-2021

Appendix 1 continued

Litigation provision	2	19	607	400	11	3
Visa Europe Framework Agreement loss	1877	0	0	0	0	0
Total operating expenses	**7199**	**6214**	**7655**	**7976**	**7765**	**8301**
Operating income	**7883**	**12144**	**12954**	**15001**	**14081**	**15804**
Non-operating Income (Expense)						
Interest expense	-427	-563	-612	-533	-516	-513
Other	**556**	**113**	464	416	225	772
Non-operating income (expense)	129	-450	-148	-117	-291	259
Income before income taxes	8012	11694	12806	14884	13790	16063
Income tax provision	2021	4995	2505	2804	2924	3752
Net income	**5991**	**6699**	**10301**	**12080**	**10866**	**12311**

Source: Visa Annual Report 2016-2021

CONSOLIDATED BALANCE SHEETS *fig in Millions $*

	2015	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
Assets							
Cash and cash equivalents	3518	5619	9874	8162	7838	16289	16487
Restricted cash—U.S. litigation escrow	1072	1027	1031	1491	1205	901	894
Investment securities :(Trading, Available-for-sale)	2497	3319	3564	3547	4236	3752	2025

Source: Visa Annual Report 2016-2021

Appendix 1 continued

Settlement receivable	408	1467	1422	1582	3048	1264	1758
Accounts receivable	847	1041	1132	1208	1542	1618	1968
Customer collateral	1023	1001	1106	1324	1648	1850	2260
Current portion of client incentives	303	284	344	340	741	1214	1359
Prepaid expenses and other current assets	353	555	550	562	712	757	856
Total current assets	**10021**	**14313**	**19023**	**18216**	**20970**	**27645**	**27607**
Investment securities, available-for-sale	3384	3931	1926	4082	2157	231	1705
Client incentives	110	448	591	538	2084	3175	3245
Property, equipment and technology, net	1888	2150	2253	2472	2695	2737	2715
Other assets	778	893	1226	1165	2232	3413	4002
Intangible assets, net	11361	27234	27848	27558	26780	27808	27664
Goodwill	11825	15066	15110	15194	15656	15910	15958
Total Assets	**39367**	**64035**	**67977**	**69225**	**72574**	**80919**	**82896**

Source: Visa Annual Report 2016-2021

Appendix 1 continued

Liabilities							
Accounts payable	127	203	179	183	156	174	266
Settlement payable	780	2084	2003	2168	3990	1736	2443
Accrued compensation and benefits	503	673	757	901	796	821	1211
Client incentives	1049	1976	2089	2834	3997	4176	5243
Accrued liabilities	849	1128	1129	1160	1625	1840	2334
Deferred purchase consideration	0	0	0	1300	0	0	0
Current maturities of long-term debt	0	0	1749	0	0	2999	999
Accrued litigation	1024	981	982	1434	1203	914	983
Total current liabilities	**5355**	**8046**	**9994**	**11305**	**13415**	**14510**	**15739**
Long-term debt	0	15882	16618	16630	16729	21071	19978
Deferred tax liabilities	3273	4808	5980	4618	4807	5237	6128
Deferred purchase consideration	0	1225	1304	0	0	0	0
Other liabilities	897	1162	1321	2666	2939	3891	3462
Total liabilities	**9525**	**31123**	**35217**	**35219**	**37890**	**44709**	**45307**
Total Equity	**29842**	**32912**	**32760**	**34006**	**34684**	**36210**	**37589**
Total Liabilities and Equity	**39367**	**64035**	**67977**	**69225**	**72574**	**80919**	**82896**

Source: Visa Annual Report 2016-2021

Appendix 2. Income statement and Balance Sheet of Mastercard 2016-2021

CONSOLIDATED STATEMENTS OF OPERATIONS *fig in Millions $*

Particulars	2016	2017	2018	2019	2020	2021
Operating Revenues						
Domestic assessments	4411	5130	6138	6781	6656	8158
Cross-border volume	3568	4174	4954	5606	3512	4664
Transaction processing	5143	6188	7391	8469	8731	10799
Other revenues	2431	2853	3348	4124	4717	6224
Gross revenue	15553	18345	21831	24980	23616	29845
Rebates and incentives (contra-revenue)	-4777	-5848	-6881	-8097	-8315	-10961
Net revenue	**10776**	**12497**	**14950**	**16883**	**15301**	**18884**
Operating Expenses						
General and administrative	3714	4526	5174	5763	5910	7087
Advertising and marketing	811	898	907	934	657	895
Depreciation and amortization	373	436	459	522	580	726
Provision for litigation settlements	117	15	1128	0	73	94
Total operating expenses	**5015**	**5875**	**7668**	**7219**	**7220**	**8802**
Operating income	**5761**	**6622**	**7282**	**9664**	**8081**	**10082**
Other Income (Expense)						
Investment income	43	56	122	97	24	11
Gains (losses) on equity investments, net	0	0	0	167	30	645

Source: Mastercard Annual Report 2016-2021

Appendix 2 continued

Interest expense	-95	-154	-186	-224	-380	-431
Other income (expense), net	-63	-2	-14	27	5	0
Total other income (expense)	-115	-100	-78	67	-321	225
Income before income taxes	**5646**	**6522**	**7204**	**9731**	**7760**	**10307**
Income tax expense	1587	2607	1345	1613	1349	1620
Net Income	**4059**	**3915**	**5859**	**8118**	**6411**	**8687**

Source: Mastercard Annual Report 2016-2021

CONSOLIDATED BALANCE SHEETS *fig in Millions $*

	2015	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
Assets							
Cash and cash equivalents	5747	6721	5933	6682	6988	10113	7421
Restricted cash for litigation settlement	541	543	546	553	584	586	586
Investments	991	1614	1849	1696	688	483	473
Accounts receivable	1079	1416	1969	2276	2514	2646	3006
Settlement due from customers	1068	1093	1375	2452	2995	1706	1319
Restricted security deposits held for customers	895	991	1085	1080	1370	1696	1873
Prepaid expenses and other current assets	663	850	1040	1432	1763	1883	2271

Source: Mastercard Annual Report 2016-2021

Appendix 2 continued

Total Current Assets	**10984**	**13228**	**13797**	**16171**	**16902**	**19113**	**16949**
Property, plant and equipment, net	675	733	829	921	1828	1902	1907
Deferred income taxes	317	307	250	570	543	491	486
Goodwill	1891	1756	3035	2904	4021	4960	7662
Other intangible assets, net	803	722	1120	991	1417	1753	3671
Other assets	1580	1929	2298	3303	4525	5365	6994
Total Assets	**16250**	**18675**	**21329**	**24860**	**29236**	**33584**	**37669**
LIABILITIES AND EQUITY							
Accounts payable	472	609	933	537	489	527	738
Settlement due to customers	866	946	1343	2189	2714	1475	913
Restricted security deposits held for customers	895	991	1085	1080	1370	1696	1873
Accrued litigation	709	722	709	1591	914	842	840
Accrued expenses	2763	3318	3931	4747	5489	5430	6642
Current portion of long-term debt	0	0	0	500	0	649	792
Other current liabilities	564	620	792	949	928	1228	1364
Total Current Liabilities	**6269**	**7206**	**8793**	**11593**	**11904**	**11847**	**13162**

Source: Mastercard Annual Report 2016-2021

Appendix 2 continued

Long-term debt	3268	5180	5424	5834	8527	12023	13109
Deferred income taxes	79	81	106	67	85	86	395
Other liabilities	572	524	1438	1877	2729	3111	3591
Total Liabilities	**10188**	**12991**	**15761**	**19371**	**23245**	**27067**	**30257**
Commitments and Contingencies							
Redeemable Non-controlling Interests		0	71	71	74	29	29
Total Equity	**6062**	**5684**	**5497**	5418	**5917**	**6488**	**7383**
Total Liabilities and Equity	**16250**	**18675**	**21329**	**24860**	**29236**	**33584**	**37669**

Source: Mastercard Annual Report 2016-2021

Appendix 3. Financial Ratio results of Visa and Mastercard 2016-2021

Current Ratio						
Years	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
Visa	1,78	1,90	1,61	1,56	1,91	1,75
Mastercard	1,84	1,57	1,39	1,42	1,61	1,29

Quick Ratio						
Years	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
Visa	1,24	1,46	1,14	1,01	1,49	1,30
Mastercard	1,35	1,11	0,92	0,86	1,12	0,83

Return on Assets						
Years	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
Visa	12%	10%	15%	17%	14%	15%
Mastercard	23%	20%	25%	30%	20%	24%

Return on Equity						
Years	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
Visa	19%	20%	31%	35%	31%	33%
Mastercard	69%	70%	107%	143%	103%	125%

Profit Margin						
Years	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
Visa	40%	36%	50%	53%	50%	51%
Mastercard	38%	31%	39%	48%	42%	46%

Appendix 3 continued

Debt to Equity						
Years	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
Visa	0,48	0,56	0,49	0,48	0,66	0,56
Mastercard	0,91	0,99	1,17	1,44	1,95	1,88

Assets Turnover ratio						
Years	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
Visa	0,29	0,28	0,30	0,32	0,28	0,29
Mastercard	0,23	0,20	0,25	0,30	0,20	0,24

Average collection period						
Years	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
Visa	22,85	21,60	20,72	21,84	26,40	27,15
Mastercard	42,25	49,43	51,82	51,78	61,54	54,62

Revenue in Millions of USD						
Years	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
Visa	15082	18358	20609	22977	21846	24105
Mastercard	10776	12497	14950	16883	15301	18884

Source: Based on the author's calculations from Appendix 1 and 2 data

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